

Serial No. 10/634,830

Docket No.: 121.1053

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 1-12, and 15 and ADD new claim 16 in accordance with the following:

1. (CURRENTLY AMENDED) A method of driving a plasma display panel including a plurality of X electrodes and a plurality of Y electrodes arranged in alternating, spaced relationship on a base plate, a plurality of X electrodes arranged between the plurality of Y electrodes, and a plurality of address electrodes spaced from and crossing the X and Y electrodes, comprising the steps of:

generating initializing discharges with at least one ramp waveform of voltage applied between the X electrodes and Y electrodes during an initializing period;

generating addressing discharges between the Y electrodes and the address electrodes during an addressing period; and

generating sustaining discharges between the X electrodes and Y electrodes during a sustaining period, said initializing period, said addressing period and said sustaining period being cyclically recurred recurring,

wherein the voltage of a driving waveform for each electrode satisfies the following relational expression:

$$2V_{iAY} - V_{oxy} \leq 2V_{AY} - V_{xy} - 2V_{off},$$

wherein V_{iAY} denotes a discharge starting threshold voltage between the address electrodes and the Y electrodes, and V_{oxy} denotes a discharge starting threshold voltage between the X electrodes and the Y electrodes, respectively, when the Y electrodes serve as cathodes,

wherein V_{AY} denotes a voltage applied between the address electrodes and the Y electrodes, and V_{xy} denotes a voltage applied between the X electrodes and the Y electrodes, respectively, at the trailing edge of the ramp waveform at the end of the initializing period, and

wherein V_{off} denotes an offset voltage of the voltage applied between the address electrodes and the Y electrodes at the end of the sustaining period.

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2. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 1, wherein, when a driving waveform having two or more types of offset voltages V_{soft} is used in the sustaining period, the plasma display panel is driven by setting the voltage of the driving waveform so as to satisfy the relational expression at the end of the sustaining period.

3. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 1, wherein, when a driving waveform having an alternating voltage with two or more types of amplitudes is used as a driving waveform to be applied between the address electrodes and the Y electrodes in the sustaining period, the plasma display panel is driven by setting the voltage of the driving waveform so as to satisfy the relational expression at the end of the sustaining period.

4. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 1, wherein, when the address electrodes serve as a cathode, V_{tXY} denotes a discharge starting threshold voltage between the X electrodes and the address electrodes, and V_{tYA} denotes a discharge starting threshold voltage between the Y electrodes and the address electrodes,

when the X electrodes serve as a cathode, V_{tAX} denotes a discharge starting threshold voltage between the address electrodes and the X electrodes, and V_{tYX} denotes a discharge starting threshold voltage between the Y electrodes and the X electrodes, and

the plasma display panel arranged to satisfy satisfies the following relational expression is used:

$$V_{tAY} + V_{tXA} - V_{tXY} > 0 \text{ or}$$

$$V_{tYA} + V_{tAX} - V_{tYX} > 0.$$

5. (CURRENTLY AMENDED) A method of driving a plasma display panel including a plurality of Y electrodes arranged on a base plate, a plurality of X electrodes arranged between the plurality of Y electrodes, and a plurality of A electrodes crossing the X and Y electrodes, the method providing a recurring cycle of an initializing period, an addressing period, and a sustaining period, the method comprising:

applying a ramp waveform in the initializing period; and

wherein applying a sustaining pulse applied in the sustaining period to each of the X

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electrodes and the Y electrodes which includes an alternating pulse oscillating between both sides of a predetermined reference voltage, at least in the beginning portion of the sustaining period, and a pulse of a positive voltage based on the reference potential at the end of the sustaining period.

6. (CURRENTLY AMENDED) A method of driving a plasma display panel including a plurality of X electrodes and a plurality of Y electrodes arranged in an alternating, spaced relationship on a base plate, a plurality of X electrodes arranged between the plurality of Y electrodes, and a plurality of address electrodes spaced from and crossing the X and Y electrodes, the method providing an initializing period, an addressing period and a sustaining period, being cyclically recurred, the method recurring, and comprising:

applying a ramp waveform in the initializing period; and
wherein applying a waveform applied to the address electrodes in the sustaining period which includes a constant voltage waveform of a negative voltage, based on a predetermined reference potential, which is applied at least at the end of the sustaining period.

7. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 6, wherein the waveform applied to the address electrodes is a constant voltage waveform of negative voltage, based on the predetermined reference potential, which is applied during the entire sustaining period.

8. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 6, wherein the waveform applied to the address electrodes includes a constant voltage waveform set at the level of the predetermined reference potential, at least in the beginning portion of the sustaining period, and a constant voltage waveform of negative voltage based on the reference potential, which is applied at the end of the sustaining period.

9. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 7 or 8, wherein:

the reference potential is regarded as at a ground level, and
a sustaining pulse, applied to each of the X electrodes and the Y electrodes in the sustaining period, is an alternating pulse oscillating between both sides of the ground level.

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10. (CURRENTLY AMENDED) A method of driving a plasma display panel according to claim 7 or 8, wherein:

the reference potential is regarded as at a ground level, and a sustaining pulse, applied to each of the X electrodes and the Y electrodes in the sustaining period, is an alternating pulse of positive voltage based on the ground level.

11. (CURRENTLY AMENDED) A method of driving a plasma display panel including a plurality of X electrodes and a plurality of Y electrodes arranged in an alternating, spaced relationship on a base plate, a plurality of X electrodes arranged between the Y electrodes, and a plurality of address electrodes spaced from and crossing the X and Y electrodes, the method providing an initializing period, an addressing period and a sustaining period, being cyclically recurred, the method recurring, and comprising:

applying a ramp waveform in the initializing period; and wherein applying a waveform applied to the address electrodes in the sustaining period which includes a constant voltage waveform of a positive voltage, based on a predetermined reference potential, at least in the a beginning portion of the sustaining period, and a constant voltage waveform, at the level of the reference potential, at the end of the sustaining period.

12. (CURRENTLY AMENDED) A method of driving a plasma display panel including a plurality of X electrodes and a plurality of Y electrodes arranged in an alternating, spaced relationship on a base plate, a plurality of X electrodes arranged between the Y electrodes, and a plurality of address electrodes spaced from and crossing the X and Y electrodes, the method providing an initializing period, an addressing period and a sustaining period, being cyclically recurred, the method recurring, and comprising:

applying a ramp waveform in the initializing period; and wherein applying a waveform applied to the address electrodes in the initializing period which includes a constant voltage waveform of a positive voltage, based on a predetermined reference potential at the end of the initializing period.

13. (ORIGINAL) A method of driving a plasma display panel according to any one of claims 1, 5, 6, 11, and 12, wherein the ramp waveform applied to at least one type of the X electrodes and the Y electrodes includes a first ramp wave having a positive ramp and a second ramp wave having a negative ramp.

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14. (ORIGINAL) A method of driving a plasma display panel according to claim 13, wherein, in the initializing period, a waveform including the first ramp wave and the second ramp wave is applied to the Y electrodes, and a constant voltage of opposite polarity corresponding to the first ramp wave and the second ramp wave is applied to the X electrodes.

15. (CURRENTLY AMENDED) A method of driving a plasma display panel including a plurality of X electrodes and a plurality of Y electrodes arranged in an alternating, spaced relationship on a base plate, ~~a plurality of X electrodes arranged between the Y electrodes, and a plurality of address electrodes spaced from and crossing the X and Y electrodes, the method providing an initializing period, an addressing period and a sustaining period, being cyclically recurred, the method recurring, and comprising:~~

applying a ramp waveform in the initializing period; and
wherein applying at least one of a voltage between the address electrodes and the Y electrodes at the end of the initializing period, a voltage between the X electrodes and the Y electrodes at the end of the initializing period, and an offset voltage of a voltage applied between the address electrodes and the Y electrodes at the end of the sustaining period, is set at a predetermined level; and

producing two types of discharges, including a discharge between the X electrodes and the Y electrodes and a discharge between the address electrodes and the Y electrodes, are caused at the end of the initializing period.

16. (NEW) A method of driving a plasma display panel including a plurality of X electrodes and a plurality of Y electrodes arranged in alternating, spaced relationship on a base plate and a plurality of address electrodes spaced from and crossing the X and Y electrodes, comprising:

generating initializing discharges with at least one ramp waveform voltage applied between the X electrodes and Y electrodes during an initializing period;

generating addressing discharges between the Y electrodes and the address electrodes during an addressing period; and

generating sustaining discharges between the X electrodes and the Y electrodes during a sustaining period, said initializing period, said addressing period and said sustaining period cyclically recurring,

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wherein the voltage of a driving waveform for each electrode satisfies the following relational expression:

$$2V_{AY} - V_{XY} \leq 2V_{AY} - V_{XY} - 2V_{off}$$

wherein V_{AY} denotes a discharge starting threshold voltage between the address electrodes and the Y electrodes, and V_{XY} denotes a discharge starting threshold voltage between the X electrodes and the Y electrodes when the Y electrodes serve as cathodes,

wherein V_{AY} denotes a voltage applied between the address electrodes and the Y electrodes, and V_{XY} denotes a voltage applied between the X electrodes and the Y electrodes at the trailing edge of the ramp waveform at the end of the initializing period,

wherein V_{off} denotes an offset voltage of the voltage applied between the address electrodes and the Y electrodes at the end of sustaining period, and

wherein during the at least one ramp waveform voltage applied to the Y electrode during an initializing period, a voltage opposite to the ramp waveform voltage is applied on the X electrode and which is not applied to the ramp waveform.